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Two perspectives on mobile television: Consumption in a social context and Collaborative/competitive behaviors

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ABSTRACT

This paper describes two user studies aiming at uncovering two distinct aspects of end user experience with mobile television. The first experiment assessed the acceptability of using mobile TV services in a public context, while the second experiment investigated the test users' collaborative and competitive behavior as a possible motivation factor to encourage user contribution. The results from the first study suggest that users would feel comfortable watching mobile TV in a social environment, especially when combined with earplugs. The second study uncovered challenges to tackle in order to achieve mobile collaboration and that the trustworthiness of mobile services is of primary importance for users willing to contribute with content.

Keywords

User studies, situated test, panel discussion, mobile tv, social environment, collaboration, competition

1. INTRODUCTION

1.1 Context of the study

The work reported in this paper takes place in the context of the Converged Advance Mobile Media Platforms (CAMMP) project¹ and addresses the convergence of media services with mobile technologies. In this purpose, CAMMP merges 3G mobile technologies with Internet, digital TV and radio and investigates the potential of this new infrastructure which combines traditional media and user-generated content.

1.2 Motivations

The CAMMP project offers a unique opportunity to design, implement and test new mobile rich media services. Especially because the project is still in its early phase, it is crucial to identify the target population, its willingness to use such services and its expectations towards it. This is the aim of the first part of the work presented in this paper. It investigates one of the first contexts of use for mobile TV to be thought of, namely a social environment where the user has to deal with more than what happens on the screen of the device. Additionally, the population recruited for the test is composed of "early adopters", which includes the first end users of new technology and services.

The main motivation for conducting the second part of the study comes from the lack of literature in the areas of mo-

bile collaboration and competition. Human collaborative and competitive behaviors have been extensively studied in many contexts and from various approaches, but the available research does not appear to focus much on mobile settings. It is therefore interesting to investigate firstly how users perceive these two notions put in a mobile context and secondly if these behaviors could be used to motivate user-generated content creation. Moreover, research on motivation factors for user contribution has primarily focused on online services accessed from fixed platforms. Therefore, only some of the conclusions might apply to mobile online services.

1.3 Outline

Section 2 presents previous research work conducted within the topics covered by the presented studies. Then, the two test activities of interest, namely the social interaction study and the conceptual evaluation are detailed in sections 3 and 4, respectively. The main findings for each activity are presented in the according section. Finally, Section 5 concludes on the paper's contribution and opens for further research.

2. RELATED WORK

The related research referred to in this section should be seen not only as an introduction for the work presented later in the paper but also as a grounding material for future research in the areas discussed.

2.1 Consumption contexts

When dealing with the consumption of mobile media in a social context, the study reported in [1] identifies the following classification of social motivations for watching videos on mobile devices:

- Individual Viewing
 - Managing solitude
 - Disengaging from others
 - Managing transitions between spaces
- Coordinating mobile experiences with family life
 - Juggling commitments
 - Coordinating content with family
- Watching at home
- Sharing the experience
 - Watching together
 - Showing video to others

¹<http://www.cammp.aau.dk/>

- Owning and exchanging content
- Getting content onto the devices

The social interaction study presented in this paper focused on practices related to “individual viewing” and “sharing the experience”.

2.2 Competitive behavior

Analyses of human competitive behavior have been carried out by many researchers, a number of whom focused on gender issues. For instance the authors of [2] investigated the differences in behavior between women and men when choosing a payment scheme. The results show that men are more likely to choose a competition-based payment scheme (where the highest benefits go to the best performer) than women, who are influenced by their degree of risk aversion. Men on the other side compete more against other men than against women. Furthermore, Rizza and Reis focused on women’s competitive nature and presented in [3] a study on how competition impacts school girls in their academic and personal lives. The interviewees reported a negative perception of the term competition and preferred to use “comparison” instead. However, in this particular setting competition as such was perceived as achieving both positive or negative sociocultural results.

When it comes to using this competitive behavior as a motivation factor for online user contribution, von Ahn presented in [4] the principles of “games with a purpose”, which consists in creating games which solve computational problems that cannot be solved by electronic systems. This approach has been named “human computation” and is introduced in [5]. For instance [4] introduces two examples of small online games which use this principle. The first game, called the “ESP Game”² serves the purpose of image labeling while the second game, “Peekaboom” addresses exhaustive image description through locating objects in pictures.

2.3 Collaborative behavior

As for its competitive counterpart, the study of human collaborative behavior can be carried out from various perspectives. For instance Semmann documents in [6] his research on human cooperative behavior in a large group of unknown individuals. He demonstrates that humans naturally cooperate only under certain circumstances such as reputation building. Despite this rather negative conclusion, Semmann demonstrated that optional participation could sometimes promote voluntary and anonymous participation.

In another study, Tyler and Blader reported in [7] that the main antecedent for cooperating in a social group is the notion of identity. Maintaining a favorable image of oneself and of the group appears of primary importance and influences the group members’ behavior.

Furthermore, motivational factors have been described in various setups with existing services. For instance [8] and [9] investigated the practice of tagging pictures using web-based photo sharing platforms like Flickr. While Ames and Naaman defined a taxonomy of tagging motivations along

²www.espgame.org

the sociality and function axes [8], Nov et al. report that the motivation to tag for the general public or oneself is positively correlated to the number of tags, whereas it is not the case when it comes to tagging for family and friends [9].

Finally, [10] assesses social psychology theories as a driving tool for encouraging user participation in online communities. Reminding the contribution’s uniqueness to their creator as well as assigning challenging goals seem to be an efficient way of ensuring user contribution.

3. SOCIAL INTERACTION STUDY

3.1 Presentation

The purpose of this activity was to investigate how users handle the consumption of rich media in a social context. We carried out this investigation through a situated testing approach in which test users were observed while consuming rich media in a live and natural context (e.g. while situated in a canteen). Immediately after, they were debriefed via semi-structured interviews.

3.2 Test setup

The evaluation took place in one of the canteen areas at Aalborg University, between morning and early afternoon (roughly between 10.30 and 13.30) i.e. when there were other people in the canteen. All participants were interviewed for approximately 30 minutes each. The tasks performed by the participants were carried out on Nokia N77 phones, receiving a DVB-H signal from a local broadcast setup. The test environment is illustrated in Figure 1.



Figure 1: The canteen as test environment for the social interaction study

3.2.1 Tasks to be carried by test participants

During the test session, each participant carried out the following set of tasks, while being asked a set of related questions.

- Start up the TV-player application on the device.
- Surf the available channels.
- Tune in on the news channel and watch two full news stories; also pay attention to a textual news ticker located at the bottom of the screen.

3.2.2 Participants

In total 26 participants were recruited (3 females and 23 males). As means of compensation, all participants received a food-voucher to be used in the canteen. The participants

were recruited among students and staff from Aalborg University. The participants were 24.2 years old in average, among who 21 expressed a high level of IT literacy. Four reported a moderate level, while only one reported a low level (although this participant reported being more comfortable with mobile phones than with computers).

3.3 Main findings

Interviewed users reported a strong willingness to watch mobile TV in social contexts, especially outside the home in situations of static mobility (e.g. public transports). Commuting hours and evening were the most envisioned time of usage. News was clearly the most cited type of content to be watched, in order not only to stay up-to-date but also to kill time. Most participants reported foreseeing to be comfortable when watching mobile TV in a public context, especially among strangers, although they would use earplugs when doing so. Furthermore, it has been repeatedly reported by test participants that the practice of watching TV in such context is similar and comparable to the practice of reading the newspaper or listening to music. For what concerns their experience with the mobile TV solution on the Nokia N77, they reported a very positive first opinion, especially with the image resolution. Complaints were however reported concerning long delays when switching channels.

4. CONCEPTUAL EVALUATION

4.1 Presentation

The purpose of this activity was to investigate the concepts of competition and collaboration which are involved by the use of rich media services in a social mobile context. Informal panel discussions were used for elucidating these issues. Each panel discussion started with a brief introduction of the CAMMP project and its scope, which was followed by the illustration of the two concepts of focus (collaboration and competition) through real-world examples. A selection of scenarios were used as examples of possible concrete applications where collaboration and/or competition are involved. In these scenarios, the collaboration scheme is to be interpreted as an implicit behavior: users collaborate with each other mainly through the use of the service, in opposition to direct collaboration where users would team up prior to interacting with the service. Additionally, a realistic collaboration-oriented scenario was acted out by the participants themselves. The scenario required the group to identify a preferred movie from a selection of video clips. Gathering the participants' input was done through notes taken by the test facilitators as well as video recording of the test session.

4.2 Test setup

For the panel discussions, three groups of three, three and five participants were formed. The sessions took place in the afternoon and lasted approximately two hours each. All participants were paid in form of cinema tickets. The test setup is illustrated in Figure 2.

4.2.1 Participants

In total, 11 participants (10 males and 1 female) took part in the conceptual evaluation. The participants had an average age of 25 years and were, according to themselves, either moderately or highly skilled within IT (Moderately:

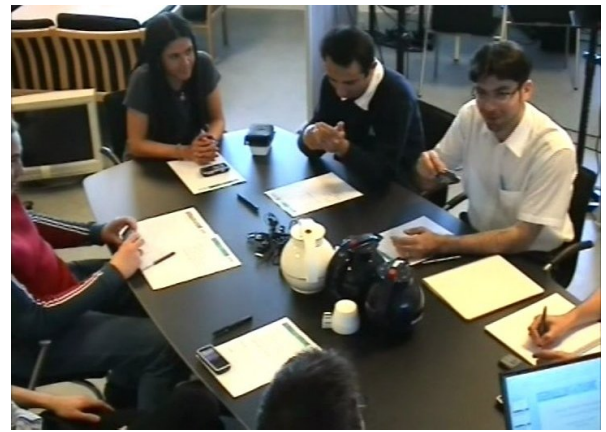


Figure 2: A meeting room as test environment for the conceptual evaluation

6, highly: 5). Based on questionnaires filled out by the participants prior to the conceptual evaluation, 72% of the participants tend to display collaborative behavior as belonging either to the group of "Creators" or "Critics" (according to Forrester's online consumer segmentation model [11]). It could therefore be speculated that almost 3/4 of the participants would be likely to contribute either with data to a platform based on user-generated content or with comments, ratings, reviews etc. to such a setup. It should however be noted that this tendency may be coupled to the relatively high IT-literacy of the participants.

4.3 Results

Two thirds of the interviewed users displayed, through a collaboration scenario, explicit collaborative behavior involving verbal communication. The users reported that during such explicit collaboration involving mobile devices, issues such as omnidirectional sound and synchronization between sound/video as well as between devices could be quite annoying. The general quality of the tested handsets (Nokia N77) as well as video content broadcast via DVB-H was however praised. It was furthermore stated that while discounts/micro rewards may motivate some users to contribute with data it would potentially also open for abuse and lead to situations of untrustworthy information. It was suggested that a high level of quality in the information available may motivate users to contribute with additional data and that feedback to contributions may be highly motivating. For what concerns driving forces for competition it was indeed found that high score functionalities would be important, especially when among friends. In order for users to be willing to use competitive services it was in addition argued that user settings should be centralized in order to make for instance gaming on various devices as convenient as possible. Also, the interoperability between all kinds of mobile terminals should be guaranteed for the same reason.

5. CONCLUSION AND FUTURE WORK

5.1 Contribution

This paper presents two user studies dealing with specific aspects of the user experience with mobile rich media services, namely the use of mobile television in a social envi-

ronment and the perception and application of collaborative and competitive behaviors with mobile rich media.

The findings from these studies suggest that early adopters have no problem neither watching informative and entertaining television programs on their mobile device in a public context, nor dealing (consciously or not) with the concepts of collaboration and competition when applied to mobile setups.

5.2 Future work

With regard to the context of use, the answers from the interviewed users could be mapped to the classification scheme introduced by O'Hara et al. in [1]. Furthermore, later studies could complement this initial mapping and provide a more complete and reliable model of the targeted population's habits in terms of mobile media consumption.

These further studies could be integrated into CAMMP's next test iteration, which will include a large scale field trial. It is envisioned to provide compatible mobile phones to a large representative segment of the Danish population and record their usage over a period of several months. This will validate the initial results concerning the context of use of mobile TV.

Foreseen future user tests include:

1. **Determining the acceptability of channel switching delays.** It is to be assessed how tolerant users are when it comes to channel switching delays.
2. **Further investigating motivational factors for contribution.** It is to be further established how end users can be encouraged to produce multimedia content as well as ratings, comments and/or reviews.

Building on the preliminary results presented in this paper, this last test would provide a better understanding of how to encourage end users to participate in the mobile TV community through user generated content. Beyond this, it would also inform future service designers on the users' inner motivations for using a particular service. Indeed, it has been recurrently discussed during the conceptual evaluation that the added value to mobile media services such as mobile TV are community-like practices such as reviews, comments and ratings. Therefore, understanding the motivational factors for user generated content should be integrated to future mobile media services.

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